White Paper

Connected Digital Signage Delivers Seamless Retail Experience to Combat Showrooming

Although online shopping provides convenience to customers, brick-and-mortar stores still offer richer retail experiences that online stores cannot provide, such as exclusive in-store services and hands-on experiences where customers can see and touch actual products before purchasing. However, physical stores today face the challenge of showrooming, a growing trend where customers visit a store to see a product and then buy it for a better price online using their smartphones or other connected devices. To promote in-store sales and combat showrooming, digital signage can be used to build a connected store providing a unique shopping experience that can attract, engage and entice customers to make purchases on the spot.

This white paper details how NEXCOM's NDiS B533 digital signage player can help combat showrooming. It will also highlight how the improvements in the graphics, multi-media and computing performance of 4th generation Intel® Core™ processors help digital signage deliver a visual feast for the eye, provide customized messages based on viewer's demographics, and offer compelling, interactive experiences in the store. In addition, the white paper will illustrate how Intel® Advanced Encryption Standard (AES) New Instructions (Intel® AES-NI) and Intel® Trusted Execution Technology (Intel® TXT) provide security for digital signage, and how Intel® Active Management Technology (Intel® AMT) technology simplifies post-implementation operation and maintenance of a large scale digital signage network.

Figure 1. Storefront displays require a highly integrated digital signage player that can provide high resolution video output and multiple display outputs.

Connected Digital Signage Provides Intelligent Interaction

In high-traffic retail environments, retailers need to design their storefronts to attract and welcome passersby, increase in-store visits, and boost sales. Storefront digital signage provides the perfect solution for impressing, entertaining, and encouraging passersby to come inside.

For storefront applications, the industry typically recommends large-screen digital signage, often over 40 inches in size or even sizes comparable to a human's height, and a range of interactive features to create strong visual presence and stand out in high-traffic environments. Such storefront displays require a highly integrated digital signage player that is compatible with various large displays, provides high resolution video output, as well as multiple display outputs, and can interface with sensors, audio and cameras so a virtual storefront staff that can detect passersby and greet them with audio to capture their attention.

In other areas of the store, to enhance the shopping experience and combat showrooming, retailers need a digital signage that can deliver personalized content, context-aware advertising, inventory integration, point-of-sale (POS) capabilities, and the ability to engage customers through touch screens and gesture recognition. This requires a digital signage player with high computing performance capable of processing the context and visual data needed for audience detection, gesture recognition and context awareness. It also requires a solution capable of secure connectivity to the back end to enable a digital sign to tell a customer other store locations where an out-of-stock item at a particular store can be found and bought immediately for instant gratification—a key advantage of physical stores. Such connectivity can also enable Internet-like shopping experiences that allow a customer to access product recommendations, reviews, companion product suggestions, and shipping options for items not in the store or that a customer want to send as a gift.

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To answer these technological needs, NEXCOM's NDiS B533 is built with 4th generation Intel® Core™ i7-4770TE processor. The 4th generation Intel Core processor family delivers significant improvements in computing, graphics and media performance. Processor performance is up to 13% faster than previous generation processors and comes with Intel Advanced Vector Extension 2 (Intel AVX 2.0), which greatly benefits image and video processing applications. Compute-intensive applications such as anonymous video analytics (AVA) and gesture controls can process software algorithms faster for audience detection and gesture recognition to respond to the real-time needs of customers and ensure more responsive experiences.

The graphic performance of the 4th generation Intel Core processor family surpasses the previous generation by up to 24%, and includes significant graphics and media enhancements. Based on the integrated Intel® HD Graphics 4600, the NDiS B533 supports 4K resolution with DirectX® 11.1 and OpenGL 4.3 graphics to deliver engaging, high impact visuals. The NDiS B533 also benefits from Intel® Clear Video HD technology, which provides full hardware-accelerated video decoding, to enhance the live streaming experience for customers.
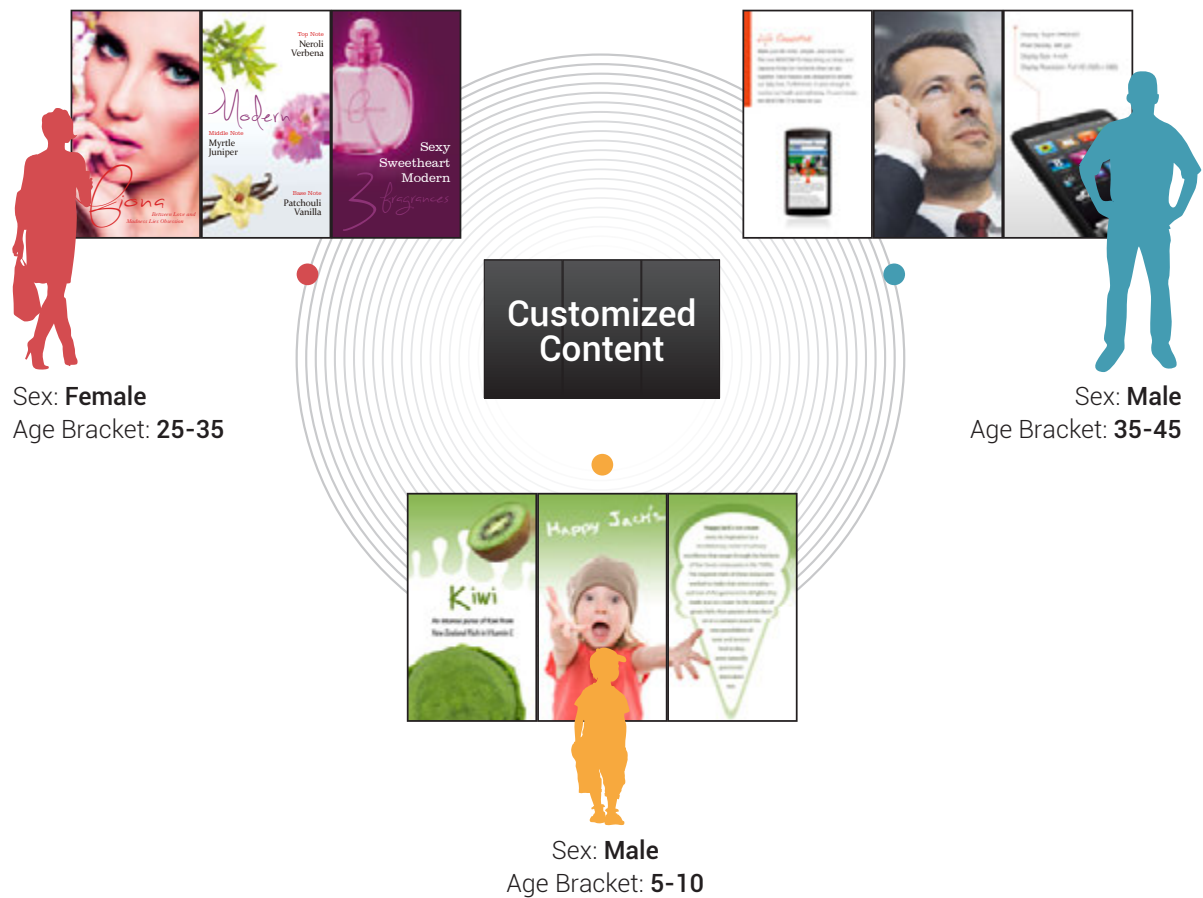

Sex: **Female**
Age Bracket: **25-35**

Sex: **Male**
Age Bracket: **35-45**

Customized Content

Sex: **Male**
Age Bracket: **5-10**

Figure 2. Retailers can use AVA to analyze the gender and age bracket of a customer and display targeted advertisements.
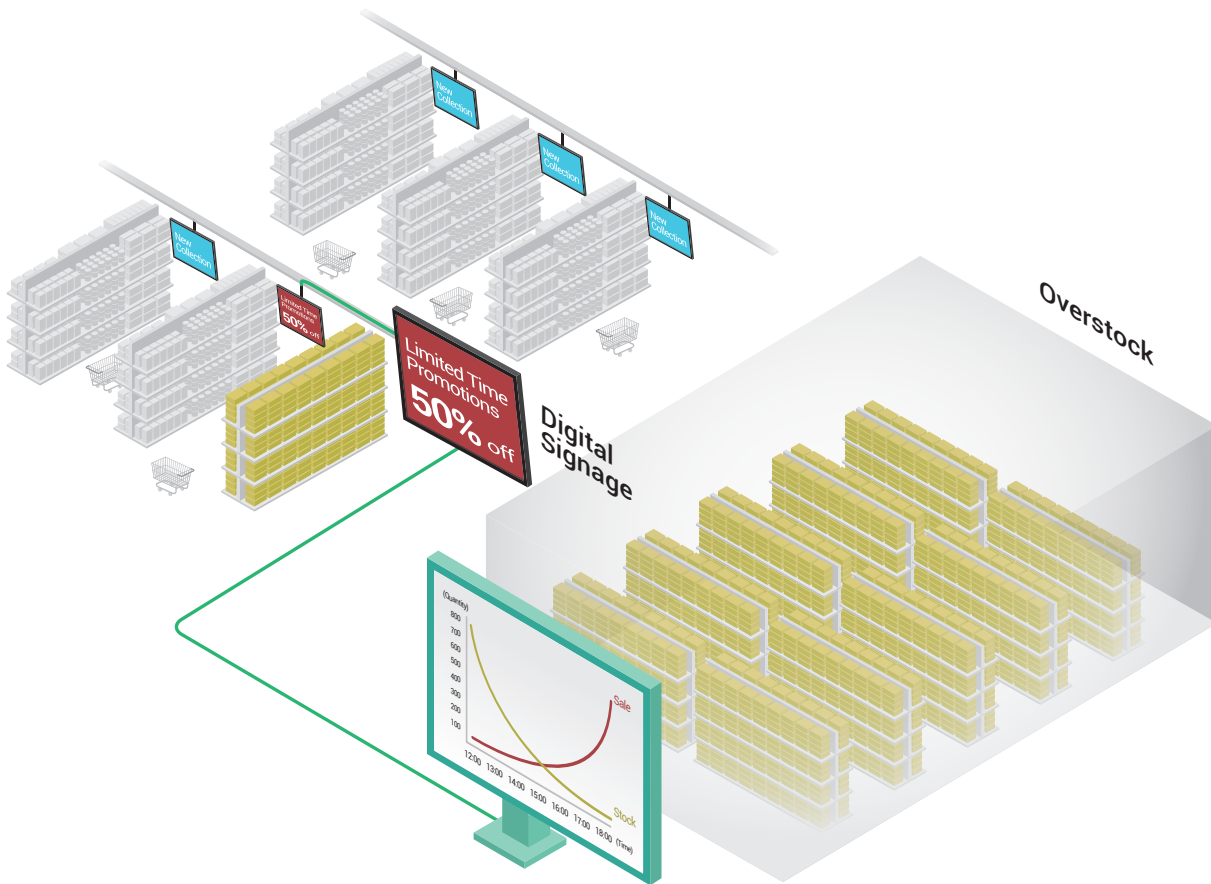
Figure 3. Digital signage connected to the inventory system can dynamically change its content to promote overstocked items.

For instance, clothing retailers can use AVA—powered by software such as Intel® Audience Impression Metrics Suite (Intel® AIM Suite)—to analyze the gender and age bracket of a customer and display targeted advertisements, such as women's clothing for female shoppers or children's wear for kids. It can also display advertisements based on current weather conditions, such as rainwear or raingear during rainy days. Furthermore, equipped with touch screens and gesture recognition systems, digital signage inside a store can function as a virtual fitting room allowing customers to choose and try on clothes in front of the digital signage for faster buying decisions.

In pharmacies, it is crucial that licensed pharmacists be available to answer inquiries about drugstore items or prescriptions and help customer with purchase decisions. If they are occupied, digital signage can act as a virtual assistant by providing live video chat services and recorded messages to customers. In addition, digital signage can incorporate barcode scanners or radio frequency identification (RFID) sensors to work with a RFID-tagged product, allowing customers to access detailed product information.

In grocery stores, digital signage connected to the inventory system can dynamically change its content to promote overstocked items. For out-of-stock items, digital signage can end the advertisements or notify customers on other store locations where the items can be bought. Combined with the data gathered by

AVA, digital signage can deliver personalized incentives on items likely to appeal to a customers' gender and age bracket, helping to increase in-store sales. Furthermore, to empower customers to make purchases quickly during peak hours, digital signage with barcode scanners and/or RFID capabilities, near field communication (NFC)—a standard feature of 4th generation Intel Core processors—and credit card readers enables customers to purchase items right at the digital sign.

Securely Monitor, Manage and Protect a Connected Digital Signage Network

In a large retail network of up to thousands of connected devices, digital signage can face a number of network-based security threats. Threats that aim to hack the digital signage and steal or change sensitive data, or attempt to disrupt system operation can impact a retailers' brand image and cause downtime.

For example, a hacker intercepting communication between a content management server (CMS) and a digital signage can potentially steal valuable copyrighted content. Sensitive payment information from credit cards processed by the digital signage may also be captured when a communication link is compromised or the digital sign is hacked. Furthermore, a hacker gaining control of digital signage can alter it to display inappropriate content.

These threats require a digital signage player that can provide hardware-enhanced security and remote manageability with out-of-band capabilities. To provide these features, NDiS B533 utilizes Intel AES-NI, Intel TXT and Intel AMT.

Intel AES-NI is a set of instructions designed to enhance the performance of AES encryption and decryption. Using Intel AES-NI, NDiS B533 can protect valuable content and sensitive payment information—transferred or stored locally—from malicious access. New instructions in Intel AES-NI enable faster hardware-based encryption and decryption, providing up to 10 times performance over software-based encryption, freeing the processor from additional computing effort so there is virtually no impact on signage performance.

To enhance secure operation of digital signage and prevent system compromise, NDiS B533 supports a trusted platform module (TPM) for Intel® TXT. Intel TXT, a hardware-based security technology, protects the system from software-based attacks that exploit the vulnerabilities of the applications that execute during system boot, such as the BIOS, firmware, operating system, and other software. Using Intel TXT, NDiS B533 can ensure that it is running on a trusted platform and secured from hackers attempting to override the control of the digital signage.

To simplify remote management and respond to downtime events quickly in a large retail network, Intel AMT technology provides out-of-band remote management with flexible provisioning features. Supporting Intel AMT technology, NDiS B533 can be tracked, monitored and managed through a single management platform. With out-of-band capabilities and Keyboard-Video-Mouse (KVM) support, Intel AMT can enable technicians to control the keyboard and mouse of the remote device even when it is powered off, as well as view the contents of the remote display, giving full control and visibility of the remote device to streamline the troubleshooting process and minimize on-site visits.

Conclusion

Designed for high performance, the NDiS B533 signage player featuring the 4th generation Intel Core i7-4770TE processor provides retailers with a powerful solution for creating a compelling
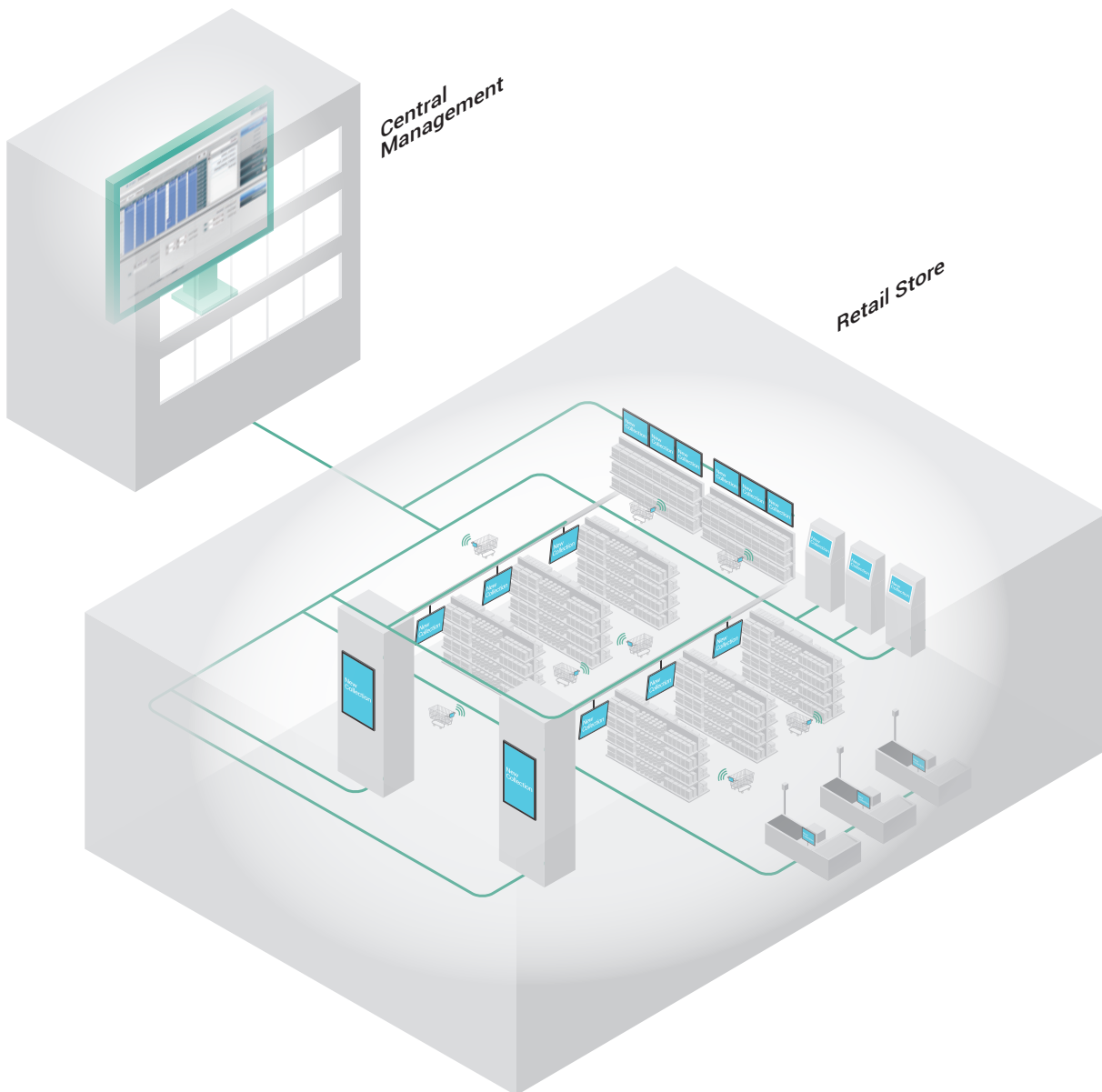
Figure 4. Intel AMT technology provides out-of-band remote management with flexible provisioning features to simplify management.

and personalized shopping experience that can help combat showrooming. The NDiS B533, using Intel AES-NI, Intel TXT and Intel AMT technologies, enables high availability while delivering robust security and remote manageability to help retailers overcome the challenges faced in deploying a large-scale digital signage network.

About NEXCOM

Founded in 1992, NEXCOM has five business units which focus on vertical markets across industrial computer, in-vehicle computer, multimedia, network and communication, and intelligent digital security industries. NEXCOM serves its customers worldwide through its subsidiaries in seven major industrial countries. NEXCOM gains stronghold in vertical markets with its industry-leading products including the rugged fanless computer NISE series, the in-vehicle computer VTC series, the network and security appliance NSA series and the digital signage player NDiS series. www.nexcom.com

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